

CLAIMS

I CLAIM:

- 1 1. A display apparatus comprising:
 - 2 At least two stationary rotating units, which are fixed on a housing with at least
 - 3 one opening for viewing;
 - 4 A moving unit, which has at least one line of light emitting elements;
 - 5 Means to provide smooth rotation for the stationary rotating units.
 - 6 A control unit to provide power and control signals to the light-emitting element
 - 7 on the moving units;
 - 8 Means to provide communication between the control unit and the moving unit;
- 1 2. The at least two stationary rotating units from claim 1 can be a cylindrical rod;
- 1 3. The cylindrical rod in claim 2 has a non-electrical-conductive surface.
- 1 4. The stationary rotating units from claim 2 are arranged parallel to each other and
2 spaced apart.
- 1 5. The at least two stationary rotating units in claim 2 can have a diameter in the
2 range of 0.5"~100";

- 1 6. The at least two stationary rotating units in claim 2 is further consists of at least
2 one extruding spike on both ends for attaching the moving unit in claim1 and for
3 rotating this moving unit around the at least two stationary rotating units from
4 claim 1;
- 1 7. The at least two stationary rotating units in claim 2 is further consists of efficient
2 bearing on each end for it to carry the moving unit for fast and smooth movement;
- 1 8. At least one of the at least two stationary rotating units in claim 2 has multiple
2 metallic rings with various widths imbedded on its cylindrical surface;
- 1 9. The means to provide smooth rotation for the stationary rotating unit in claim 1
2 comprises of motor, and electronic control means;
- 1 10. The moving unit in claim 1 comprises of a flexible substrate in dark color, which
2 wraps around the at least two stationary rotating units from claim 1 and rotates by
3 them to form at least one rotating plane defined by the at least two stationary
4 rotating units;
- 1 11. The maximum number of rotating plane defined by these rotating units are always
2 equal to the number of rotating units involved in each of the display apparatus.
- 1 12. The light emitting elements in claim 1 can be light emitting diodes, or LEDs;

1 13. The light emitting elements in claim 12 is arranged in a line parallel to the at least
2 two stationary rotating units as in claim 4;

1 14. The moving unit in claim 10 has holes on both sides of its edges with matching
2 spacing to the extruding spikes on both ends of the stationary rotating units in
3 claim 6;

1 15. The moving unit in claim 10, on the face where it makes contact with the
2 stationary rotating units, has multiple metallic strips with various widths
3 imbedded on its surface;

1 16. The imbedded multiple metallic strips from claim 15 align with the imbedded
2 multiple metallic rings on the stationary rotating unit as described in claim 8;

1 17. The imbedded multiple metallic strips from claim 15 further comprises means to
2 connect them to the light emitting elements in claim 1, which is situated on the
3 other face of the moving unit;

1 18. The control unit in claim 1 comprises of power source, image source and display
2 signal source and means to control them properly to display image on the moving
3 units lighting elements.

1 19. The communication unit in claim 1 comprises of at least one static elongate rod
2 parallels to at least one of the stationary rotating units and situated in its
3 proximity. There are extruding conductive contacts situated on its side facing the
4 stationary rotating unit and are arranged in the same pattern as those multiple
5 metallic rings imbedded on the stationary rotating unit as in claim 8, and making
6 contact with them constantly.

1 20. The elongate rod in claim 19 is made of non-electrical-conductive material.

1 21. The conductive contacts in claim 19 can be made of good electrical conducting
2 material such as brass, carbon, iron etc;

1 22. The conductive contacts in claim 19 further comprises means to connect them to
2 the control unit's power source, image source and display signal source;

1 23. The control unit in claim 18 further comprises means to transmit electronic signal
2 and data to the lines of light emitting elements through infrared or radio frequency
3 devices.

1 24. A display apparatus comprising:

2 At least two stationary rotating units, which are fixed on a housing with at least
3 one opening for viewing;

4 A moving unit, which has at least one line of light emitting elements;

5 Means to provide smooth rotation for the stationary rotating units.
6 A control unit to provide power and control signals to the light-emitting element
7 on the moving units;
8 Means to provide communication between the control unit and the moving unit;
9 A scanning method based on using at least one line of light emitting elements to
10 display an one page information in a line-by line format as it travels through the at
11 least one display viewing area defined by any two rotating units. Each of the at
12 least one line of light emitting elements will complete the scanning of the total
13 number of scanning lines containing in one image frame, before it will be required
14 to scan the same, or different image frame.

1 25. The line of light-emitting elements in claim 24 has the capability to store the
2 display information of one whole image frame.

1 26. The line of light emitting elements in claim 24 has the capability to display
2 information of one whole image frame W times through the W display viewing
3 openings, as W equals to the number of stationary rotating units associated with
4 the display apparatus.